

Flight

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PARIS FLIGHT SALON.—General view of the centre of the Grand Palais, showing the "Stands of Honour." In the middle, immediately under the spherical gas-bag, is the famous Bleriot cross-Channel machine. To its right is the "Rep" monoplane, in the extreme right foreground is the Farman biplane, to the left a French-made Wright flyer, and continuing round to the left the machines are respectively an Antoinette, a Voisin, and another Bleriot. The decorated spherical balloon in the distance is the Montgolfier.

TRIALS AND TRIUMPHS OF SCIENCE AND INDUSTRY.

It is a somewhat remarkable thing that in France circumstances are apt to produce dramatic effects. Thus, at the very time when the apotheosis of all the work that the pioneers of flight have been doing for hundreds of years past was about to be revealed by the opening of the Paris Aero Show by President Armand Fallières, the funeral service of Captain Ferber, who gave his life for the cause he loved, was almost due to take place at Boulogne. That drew attention to the part of the price that has had to be paid in connection with flight by heavier-than-air craft, and that is the department of the science of aerial navigation which it is the prime object of the Exhibition to reveal. For there is no gainsaying that in the matter of ballooning and of dirigible ballooning, the Frankfort Exhibition must be adjudged infinitely more representative and of vastly greater scientific interest than the Paris Show. At the very time that the President of the Republic entered the Grande Palais, however, there were whispered to him the grave tidings of the unhappy disaster to the dirigible balloon "La Republique," so that, as it were, there was a token of the toll that has been exacted by both branches of aerial locomotion. But while on this particular point of the price that humanity is paying for the admiralty of the air, we may recall that in the course of a recent leader in *FLIGHT*, attention was drawn to the remarkably few lives that have been lost in the development of the heavier-than-air machine. That statement stands to-day. Furthermore, considering what has been achieved and that the achieving of it has been the constant launching into the unknown, dirigible ballooning has demanded relatively few victims, while ordinary spherical ballooning has long since advanced to a stage when, provided due precaution be observed, it is quite one of the most safe of sports. Furthermore, it is somewhat unfortunate that "La Republique" should have been ordered to go to make her fatal voyage when it has been especially understood that the engineer who designed the craft, and those who captained her, were alike undesirous of going. We do feel that this is one of those unfortunate cases wherein the military spirit of saying this or that particular thing shall be done, has been introduced inadvisedly and prematurely into aerial navigation. It has been the fault of our Navy that our commanders do not have to understand engineering. That is to say, they give the orders as to what they want out of the vessel, not understanding the difficulties of being able to meet those demands.

We feel that in the case of the dirigible balloon "La Republique," four lives have been thrown away. Whether they have or not, however, cannot mend the matter, so at least we may draw one fine lesson from it of benefit to England, and that is this, that there was not a single daily paper in France that one could pick up that had not its comments, words not of pessimism in a moment of national disaster, but of encouragement and inspiration to use that disaster only to forward the science. There was no lamentation though there was ample sympathy. All the accounts are to the effect that the lives were given in the cause of science, and in the cause of the country. For the reason that we have yet many things to discover and many risks to take, it is well that this attitude should be recorded by way of a standing example. It may be that one day a British dirigible will come by disaster in the course of some useful work, and should that hour ever come along, at least it will console us to think that there

is a fine precedent of conduct behind us in the example set by Germany over the Zeppelin disaster, and now by France in the mishap to "La Republique."

As to the industry, surely it should astound any Britisher, who imagines that aeroplaning is mere toying, if he were to go to the Paris Exhibition and to discover the evidences not only of perfect workmanship and superb design, but also of the tremendous amount of capital and brains that are embarked in the service of this science. The first lesson of this current Show should be surely to impress on the minds of all and sundry this fact—*aerial navigation cannot go back, cannot stand still, but must inevitably go forward.* From whichever point of view we review the matter, we find that flight is now on a commercial basis. Let us study the number of manufacturers engaged in it. There is not a single world-famous motor manufacturing firm that has not striven to evolve either an engine for use on a dirigible, or for service on an aeroplane. As examples of engineering they are a joy to study, while it is a proud thing to be able to record that quite one of the most admired pieces of mechanism in the whole Show are the British-built Wolseley engines, alike for aeroplanes and dirigibles.

In the matter of design, it cannot be said that there is anything very radically original at the Paris Show, and it may be in part that that is to be accounted for by the fact that the Show is held at an awkward season. It comes in the very midst of the competition season, and the staffs of the aeroplane manufacturers pure and simple are not so large that it is possible to keep spare men and machines away from the factory in order to be in a great show and on a field of competition at one and the same time. Even at the Paris Show, the Voisin Company, for example, does not display its latest machine, though that is doubtless due in part to the somewhat invidious arrangements of some of the exhibits, whereby, though there are four so-called "Stands of Honour," that pioneer firm is not represented on any one of the quartette. We contend that it is a mistaken policy, in any case, to have stands of honour. What one may style the system of cliques has been ever much in evidence in the past among motor manufacturers, especially in France, and it will be a regrettable thing if such a policy is to be pursued in the future concerning the new industry, which deals also with the problem of locomotion. One imagines that it would be better to have an Exhibition of this sort in the month of December, allowing it to replace the yearly motor show, which is an enterprise not likely to be revived in Paris, for once the series of these things is broken it is difficult to resume them. The month of December should be the more convenient for visitors from abroad; also in the main the flying competition season should be over by then, or at least there should be a hiatus in it before the opening of the meetings that are sure to be arranged in the neighbourhood of the Mediterranean in the early months of the year. Furthermore, December is a month removed from the time of our own Show in the spring, so that the two events would not clash in any way. Meantime, since the Juvisy meeting is about to take place, all who have leisure may be recommended heartily to go across the Channel to inspect this very fine display, which offers many suggestions of interest alike in the organisation of the Exhibition and in the aircraft displayed there.

SANTOS DUMONT'S "DEMOISELLE."

DETAILS OF THE SMALLEST KNOWN FLYER IN THE WORLD.

ALTHOUGH the historic cross-Channel Bleriot is a close rival to it, there is no doubt but that the chief centre of interest in the exhibition now open in Paris is that

Clement and Mons. Charron, whereby a thousand of these little voituresses of the air are to be turned out at a reasonable price, and within a short period.

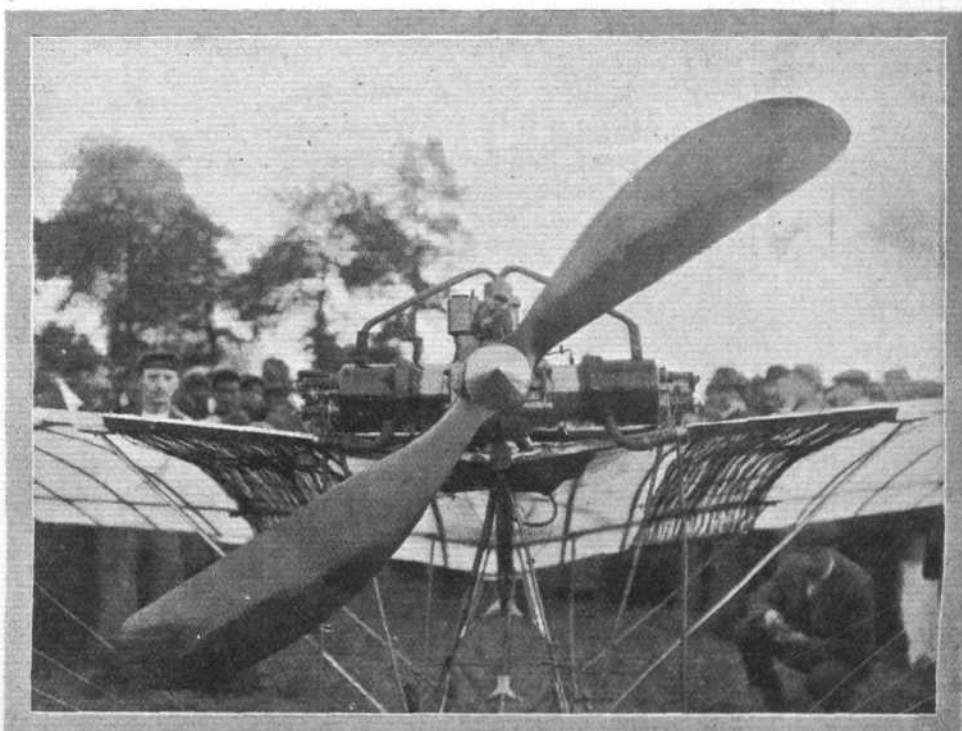
Apart from the more popular reason why so much attention is being devoted just now to the "Santos No. 20," there are many excellent technical reasons that warrant that attitude from all serious well-wishers of the science of flight. After all said and done, this machine has flown, and flown with ease and certainty almost from the first moment that it saw the light of day outside the factory, and yet its total weight is but 240 lbs. or thereabouts, while its external dimensions do not exceed some 20 ft. across by 18 ft. fore and aft, by 4 ft. 2 in. in height—or if the vertical dimension was taken to the top of the propeller in its extreme position the overall height is approximately 7 ft. 5 in.

For these reasons, and also because of the cunning manner in which that not altogether satisfactory material bamboo is used for the chassis, for the main planes, and for the rudder, the following detailed description which we are able to give will doubtless receive a hearty welcome from all readers. Accompanying this description

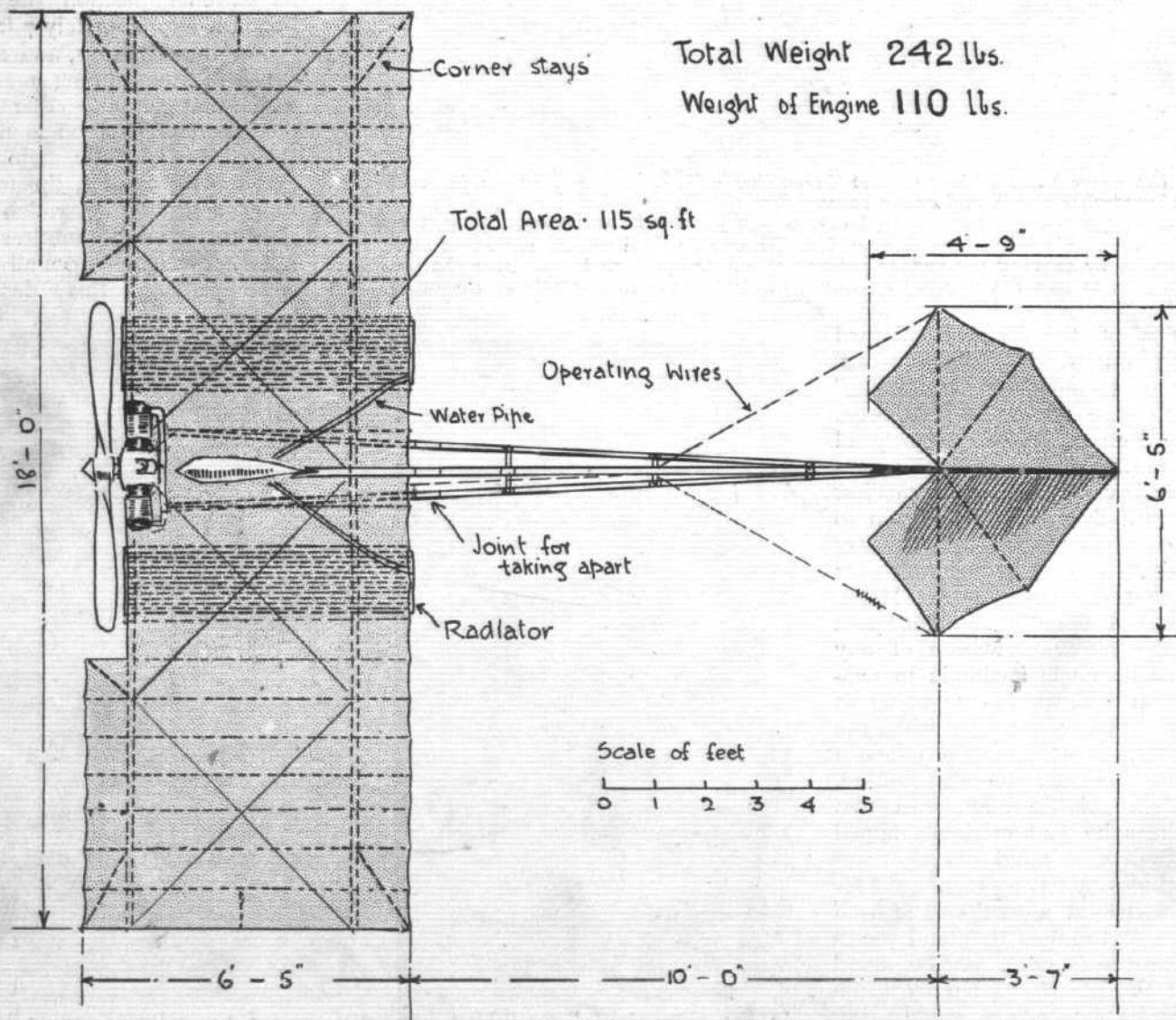
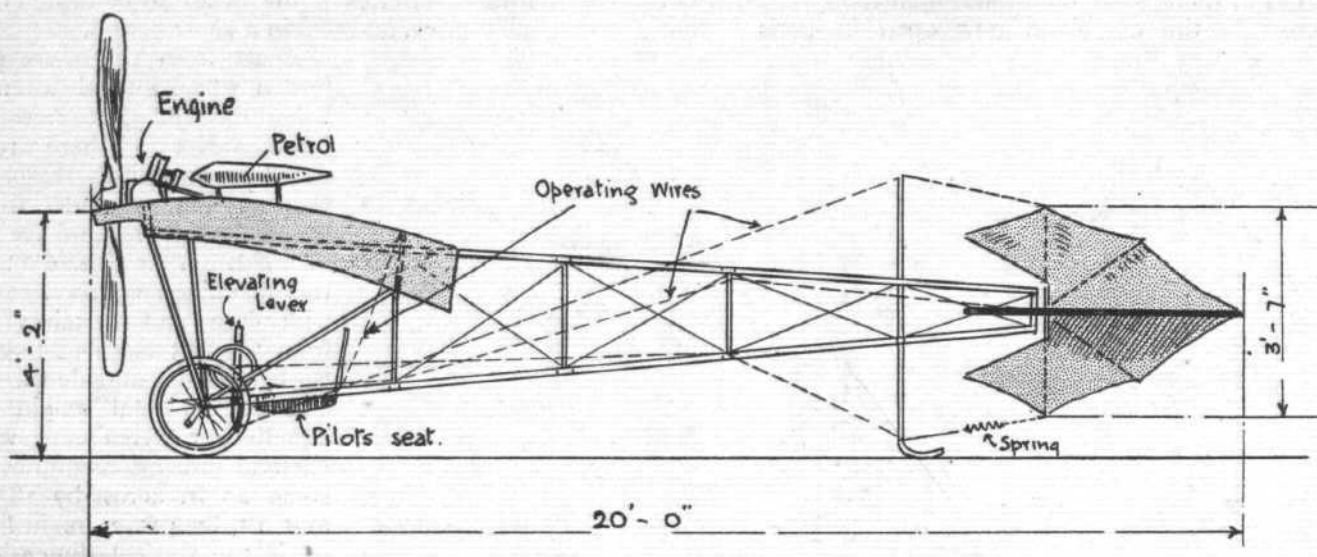


In the above central view of the "Demoiselle" M. Santos Dumont is occupying the somewhat rough and ready canvas seat that is provided for the pilot. He has in his right hand the elevating lever, which moves the universally-jointed tail up or down; his left hand is grasping the small wheel which serves to steer the machine by moving the rudder sideways, and at his back is the lever that enables him to flex the wings by leaning his body over to one side or the other.

corner of the Clement - Bayard stand on which reposes Mons. Santos Dumont's "Demoiselle," or, to give it the title it bears, "Le Santos No. 20." Partly all the world flocks round this monoplane because it is the smallest practical flyer which is known to have accomplished its primary object. But everyone also goes to see it in consequence of Mons. Santos Dumont's announcement of the free presentation of any rights he might maintain in connection with it, to the world at large. In connection with the exhibit, the designer has issued a printed circular for distribution, and in this he announces that whereas he had originally hoped that anyone could obtain these machines by having them built for themselves at a total cost of from some six to seven thousand francs (£240 to £280), yet he found that the prices charged by manufacturers for engines would inevitably increase that figure at the moment. The circular announces, however, that arrangements have been made by him with Mons.



In the "Demoiselle" the 30-h.p. horizontal-opposed two-cylinder engine is fixed centrally above the dihedral angle made by the two main planes. The propeller, carried direct on the front end of the crank-shaft, is some 6 ft. 6 in. in diameter, and constitutes the fly-wheel. In the above view, the very straggling multi-tubular radiators lying on either side of the motor, and snugly stowed away beneath the main frames, are seen.

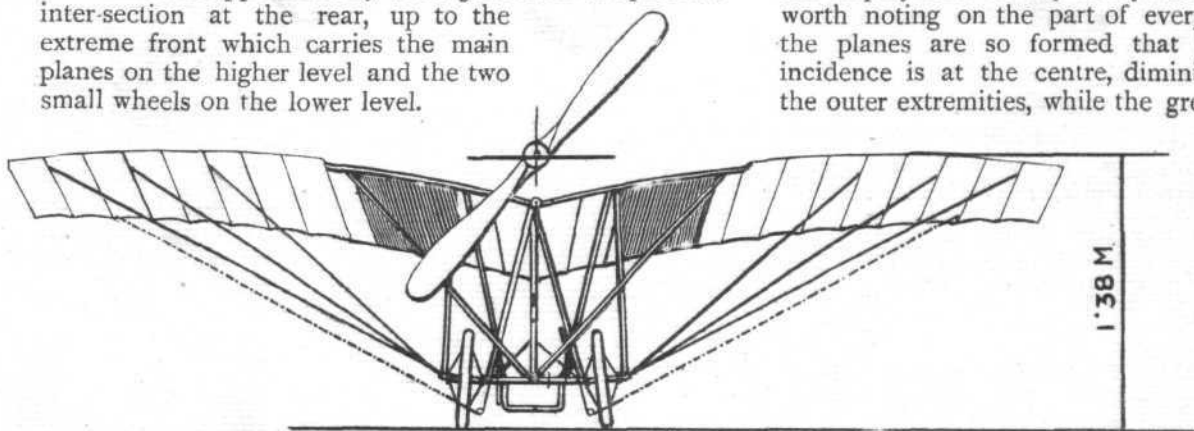


M. Santos Dumont's "Demoiselle" Monoplane, No. 20.

we are able to give a sheet of drawings of the type which we have already made peculiarly our own in this connection, besides another line drawing which comprises a front elevation of the complete machine and sundry photos that clearly demonstrate the nature of the framework as well as the manner in which the motor is carried upon it. The special drawing referred to has all the principal dimensions marked thereon, and as usual this comprises side elevation and plan. In addition to the photographs published herewith we would also remind the reader that four other views appeared in the last issue of *FLIGHT*, showing the machine in the air, being transported by motor car, and in respect to its important details.

The Chassis.

A main frame of girder construction is formed by three stout bamboos which are about 2 ins. in diameter at the thickest places, and are arranged two on a lower level with the other centrally above them. Inter-connecting them together are steel struts of oval section, and this main frame is approximately 16 ft. 5 in. from the point of inter-section at the rear, up to the extreme front which carries the main planes on the higher level and the two small wheels on the lower level.



The above front elevation of the "Santos No. 20," shows the method of staying the main planes, and also of flexing them. The drawing indicates, moreover, the positions occupied by the special radiators.

A practice is made in this machine of smoothing down all the bamboo knots, presumably to reduce their resistance, and of binding the bamboos between the knots so as to prevent splitting. All diagonal wires are, moreover, provided with neat little tighteners, none of which are more than an inch long. Our illustrations very clearly show the precise shape of the triangular girder frame, to which we have just referred, and also indicate the position and nature of the seat that accommodates the operator. This seat merely consists of a piece of canvas stretched across between the two lower main bamboos, the operator thus being placed quite low down in the chassis, and just aft of the two supporting bicycle wheels. Other features of the main frame are the provision of a special universal joint which carries the tail, and of a special vertical member fixed some three feet from the rear end, which not only serves to carry the wires which operate the elevator portion of the tail, but which has a runner formed at its foot to act in conjunction with the two wheels when the machine is resting on the ground. It will be observed that this runner is all that is required, inasmuch that as soon as the monoplane gets going the tail end lifts free of the ground before the fore portion rises.

A further important characteristic of the girder is that it is divided in the neighbourhood of the rear of the

main planes, so that it can be taken apart without difficulty. Brass sockets are fitted for this purpose.

The Main Planes.

Two main transverse spars constitute the principal members of the two main planes, which are set at a dihedral angle to one another, in accordance with M. Santos Dumont's well-known beliefs on this subject. These spars are of ash, but are not of an even section throughout their entire length, being heaviest a few feet away from the dihedral angle, where they are about 2 ins. wide by about $1\frac{1}{8}$ ins. deep and tapering down to a bare inch in depth, though still retaining a width of a couple of inches where they are joined to the central bamboo. The front spar lies some 9 ins. behind the leading edge of the frame, while the rear one is about 12 ins. forward of the trailing edge, and the planes are otherwise built up with bamboo ribs fixed beneath the two main spars while the surfacing is double and is formed of silk.

A further feature of the construction of the planes is the employment of light bamboo corner-stays which save the employment of any heavy end-rib, and are thus well worth noting on the part of every designer. In shape, the planes are so formed that the angle of greatest incidence is at the centre, diminishing slightly towards the outer extremities, while the greatest camber is not as

near the leading edge as usual, being barely in front of the centre.

With a total span of 18 ft., and a chord of 6 ft. 5 ins., it will be observed that the total area of the planes is about 115 sq. ft., and that the aspect ratio is approximately 2.8. As regards the camber, this is roughly about 4 ins. Other con-

structional details that are of importance while still speaking about the main planes, include the following:—The leading and trailing edges are caused to be quite sharp, owing to the use of wires that are fitted to the ends of the rib; pockets are formed in the planes, owing to a line of sewing being run between the various ribs; and another unusual detail is that no wires are to be found above the planes, all wire diagonals being arranged between the surfaces.

The Tail.

As already briefly indicated, the tail moves as a whole and is pivoted on a universal joint for that purpose. This part of the machine in particular is commendable in design, and the construction is certainly preferable to other methods in common use, in which one of the elements of the tail is divided in order to allow for the movement of the other. As will be observed, the ball-and-socket joint lies some 10 feet behind the trailing edge of the main plane, and the motion of the tail upwards and downwards for elevating, as well as sideways for steering, is controlled by steel wires in the manner that can to some extent be followed in our special illustrations.

Both tail surfaces are quite flat, being free from camber, and are stretched upon bamboo ribs. The horizontal surface constituting the elevator is 6 ft. 5 in. across from

tip to tip, and measures 4 ft. 9 in. fore and aft between its extreme points, while the vertical rudder surface has a similar shape, and an equal fore-and-aft dimension, but possesses a considerably less total area than the elevator.

Controlling Mechanism.

There are three principal means whereby the pilot can control the machine, apart from the switch-button, which is coupled up in the ignition system for the engine, and is fixed to the elevating-lever. The first of these is the elevating-lever, by means of which the tail is moved up and down, and this lever lies close to the right-hand of the pilot, as may be seen in our illustration. Next should be mentioned the small hand-wheel, which lies on the left, this controlling the steering-gear inasmuch as it enables the rudder to be moved bodily backwards and forward sideways. And thirdly there is a lever lying against the aviator's back which enables him to warp the wings by leaning his body over to left or right as may be needed. Leaning to one side causes the rear edge of the wing on the opposite side to be flexed downwards, and thus causes that side of the machine to rise. It will be observed that there is no actual connection between the wing-flexing and the tail control, which is a very important detail to be noted.

Another detail which concerns the controlling mechanism on "Le Santos No. 20" is that springs are introduced in the controlling wires for each of the steering systems so as to maintain them taut under all conditions.

The Engine and Propeller.

As regards the motor itself, this is of the twin-cylinder horizontal type with opposed cylinders. The bore and

stroke are respectively 130 mm. and 120 mm., and an output of about 30 h.p. is available, with a total weight of some 110 lbs. Brass jackets are used for circulating the water around the cylinders, and the valves, which are all mechanically operated, are situated in the cylinder-heads. Auxiliary exhaust-ports drilled through the cylinder-walls constitute an additional means of escape for the burnt gases, and the crank-shaft receives the propeller direct upon its front end, so that no additional fly-wheel is needed.

This engine is mounted upon the upper bamboo, and additional supports for it are provided between the cylinder-heads and the front transverse-spars of the main planes. It is, therefore, carried bodily up above the planes—indeed, at an unusually high altitude, and since the propeller is no less than 6 ft. 6 ins. in diameter, the blades consequently cut across the line of sight of the operator. The propeller, moreover, lies very close up to the leading edge of the planes.

Concerning the auxiliaries to the motor, a brass petrol tank of torpedo shape is fixed above the central angle of the planes, and the carburettor lies immediately beneath the motor, while a special type of radiator is used for cooling the water, and is placed on either side, as may be observed in our illustrations. This radiator is made in two sections, each of which extends the full width of the main planes, and is situated close underneath them. It is formed of very small tubes connecting a larger front tube with a larger rear tube, the small connecting tube being only about $\frac{1}{8}$ th of an inch in external diameter; some hundred of these tubes are employed on each side, and they are made of copper.

BLACKPOOL MEETING.

ALTHOUGH at the time of going to Press the final arrangements had not actually been completed, enough had been done to show that the Flying Week would certainly be held at Blackpool, and that a sufficient number of successful flyers had been secured to guarantee its success. The arrangements will be modelled on similar lines to that of Rheims, which worked so successfully, and four International events will be included. A provisional minimum list of prizes for these competitions has been drawn up as follows:—

Long Distance Race.

First prize, £2,000. Second prize, £720. Third prize, £280.
In addition, at least £400 will be given to the aviator remaining longest in the air, should he not gain either the first or second prize.

Speed Race (distance not yet decided).

First prize, £400. Second prize, £100.

Passengers' Race.

(Distance and rules not yet decided, but probably the calculations will be on the greatest total weight carried.)

First prize, £400. Second prize, £100.

Height Competition.

First prize, £600. Second prize, £240. Third prize, £160.

The chief prize in the distance contest (£2,000) has been presented by the Lancashire Aero Club, and that body is contributing £5,000 towards the guarantee fund. A prize of £500 has been offered by the *Daily Mail*, and the £1,000 *Daily Mail* prize for the first circular mile flight by a British aviator on a British machine will be open for competition during the week. A very encouraging feature is the number of entries which have

been received from British flyers, and it is hoped that one result of the meeting will be to show that Great Britain is not so backward after all. At the request of the Aero Club, the donor of the £500 prize for flying round the Blackpool Tower has agreed to withdraw it.

Already the work of preparing the aerodrome on the South Shore has been commenced, and the scale of charges for admission drawn up. Reserved seats in the grand stand will cost from three to five guineas for the week, according to position, while for admission to the paddock in front of the grand stand, where 10,000 people can be accommodated, the charge will be ten shillings per day or two guineas for the week. And in the one shilling and two shilling enclosures between 80,000 and 90,000 people can find standing room.

Altogether it is estimated that the cost of the meeting will amount to £17,000, and it has been decided that the subscribers to the guarantee fund will share the profits after all expenses have been paid. With a view to ensuring that visitors may not be kept away by fear of exorbitant hotel charges, the Blackpool Corporation announce that they have come to an understanding with the hotels and boarding-houses in the town that their charges during the week shall not be more than 5 per cent. in excess of the usual rates.

Among the best known aviators who have made arrangements to come are Mr. Henry Farman, M.M. Paulhan and Rougier, while Mr. S. F. Cody will in all probability be amongst the flyers. Mr. J. T. C. Moore-Brabazon, Mr. Frank McClean, and Mr. A. M. Singer are prominent in the list of Britishers who are likely to be seen in the air during the meeting.

HOW TO GLIDE.

By WILBUR WRIGHT.

IN the following account Wilbur Wright describes some of his early experiments, and points out very clearly the why and wherefore of the many important features of his machine. Why he discarded the tail in favour of the elevator, and how he came to make the important discovery of the retrogression of the centre of pressure on cambered aerofoils at very small angles of incidence, are here set forth with precision and lucidity. As to his style of writing, the frank chattiness of it will come as a surprise to those who have imagined Wilbur Wright as a somewhat dour character; some of his allusions, as for instance to the "gravity motor," are delightfully humorous. Altogether the account of his early experiences forms one of the best guides for the modern beginner to study that could possibly be published at the present time. The present article is taken from a Paper which Wilbur Wright read before the American Western Society of Engineers, and was originally published in *The Automotor Journal* of February, 1902.

Initial Difficulties.

The difficulties in the pathway to success in flying machine construction are of three general classes.

1. Those which relate to the construction of the sustaining wings.

2. Those which relate to the generation and application of the power required to drive the machine through the air.

3. Those relating to the balancing and steering of the machine after it is actually in flight.

Of these difficulties two are already to a certain extent solved. Men already know how to construct wings or aeroplanes which, when driven through the air at sufficient speed, will not only sustain the weight of the wings themselves, but also that of the engine and the pilot. Men also know how to build engines and propellers of sufficient lightness and power to drive these planes at sustaining speed. As long ago as 1893 a machine (Maxim's) weighing 8,000 lbs. demonstrated its power both to lift itself from the ground, and to maintain a speed of from 30 to 40 miles an hour; but it came to grief in an accidental free flight, owing to the inability of the operators to balance and steer it properly. This inability to balance and steer still confronts students of the flying problem, although nearly ten years have past. When this one feature has been worked out, the age of flying machines will have arrived, for all other difficulties are of minor importance.

Lessons from Birds and Models.

The person who merely watches the flight of a bird gathers the impression that the bird has nothing to think of but the flapping of its wings. As a matter of fact, this is a very small part of its mental labour. To even mention all the things a bird must constantly keep in mind in order to fly securely through the air would occupy considerable space.

If I take a piece of paper and, after placing it parallel with the ground, suddenly let it fall, it will not settle steadily as a staid, sensible piece of paper ought to do, but it insists on contravening every recognised rule of decorum, turning over and darting hither and thither in the most erratic manner, such after the style of an untrained horse.

Yet this is the style of steed that men must learn to manage before flying can become an everyday sport. The bird has learned this art of equilibrium and learned it so thoroughly that its skill is not apparent to our sight.

Methods of Learning.

Now, there are two ways of learning how to ride a fractious horse—one is to get on him, and learn by actual practice how each motion and trick may be best met; the other is to sit on a fence and watch the beast awhile, and then, retiring to the house, figure out at leisure the best way of overcoming his peculiarities. The latter

system is safest; but the former, on the whole, turns out the larger proportion of good riders. It is very much the same in learning to ride a flying machine; if you are looking for perfect safety you will do well to sit on a fence and watch the birds, but if you really wish to learn you must mount a machine and become acquainted with its tricks by actual trial.

Where Gliding Began.

Otto Lilienthal seems to have been the first man who really comprehended that balancing was the first instead of the last of the great problems in connection with human flight. He began where others left off, and thus saved the many thousands of dollars that it had theretofore been customary to spend in building and fitting expensive engines to machines which were uncontrollable when tried. He used gravity as his motor, which not only cost him nothing to begin with, but required no expensive fuel while in operation and never had to be sent to the shop for repairs.

The gravity engine has this one serious drawback, however, that it always insists on fixing the conditions under which it will work. These are that the man shall first betake himself and his machine to the top of the hill and fly with a downward as well as a forward motion.

Although Lilienthal may have thought the conditions rather hard he accepted them until something better should turn up, and in this manner made some 2,000 flights, some of them more than 1,000 ft. in length. Lilienthal, therefore, demonstrated the feasibility of actual practice in the air. He was followed by Pilcher, a young English engineer, and by Chanute, a distinguished member of the American Western Society of Engineers.

Theory and Practice.

The balancing of a gliding or flying machine is very simple in theory. It merely consists in causing the centre of pressure to coincide with the centre of gravity, but in actual practice there seems to be an almost boundless incompatibility of temper which prevents their remaining peaceably together for a single instant, so that the operator, who in this case acts as a peacemaker, often suffers injury to himself while attempting to bring them together.

If a wind strikes a vertical plane, the pressure on that part to one side of the centre will exactly balance that on the other side, and the part above the centre will balance that below. This point we call the centre of pressure.

But if the plane be slightly inclined, the pressure on the part nearest the wind is increased, so that the centre of pressure is located, not in the centre of surface, but a little towards the side.

The Centre of Pressure.

If the plane be still further inclined the centre of pressure will move still farther forward; and if the wind blow a little to one side it will also move over as if to

meet it. Now, since neither the wind nor the machine for even an instant maintains exactly the same direction and velocity, it is evident that the man who would trace the course of the centre of pressure must be very quick of mind; and he who would attempt to move his body to that spot at every change must be very active indeed. Yet this is what Herr Lilienthal attempted to do, and did do with most remarkable skill, as his 2,000 glides sufficiently attest. However, he did not escape being overturned by wind gusts several times, and finally lost his life through a breakage of his machine due to defective construction. The Pilcher machine was similar to that of Lilienthal, and, like it, seems to have been structurally weak, for on one occasion, while exhibiting the flight of his machine to several members of the Aeronautical Society of Great Britain, it suddenly collapsed and fell to the ground, causing injuries to the operator which proved sadly fatal. The method of management of this machine differed in no important respect from that of Lilienthal, the operator shifting his body to make the centres of pressure and gravity coincide. Although the fatalities which befell the designers of these machines were due to the lack of structural strength rather than to lack of control, nevertheless it had become clear to the students of the problem that a more perfect method of control must be evolved.

Early Gliders Compared.

The Chanute machines marked a great advance in both respects. In the multiple-wing machine the tips folded slightly backward under the pressure of wind gusts, so that the travel of the centre of pressure was thus largely counterbalanced. The guiding of the machine was done by a slight movement of the operator's body toward the direction in which it was desired the machine should go. The double-deck machine, built and tried at the same time, marked a very great structural advance, as it was the first in which the principles of the modern truss bridges were fully applied to flying machine construction. This machine, in addition to its greatly-improved construction and general design of parts, also differed from the machine of Lilienthal in the operation of its tail.

In the Lilienthal machine the tail, instead of being fixed in one position, was prevented by a stop from folding downward beyond a certain point, but was free to fold upward without any hindrance. In the Chanute machine the tail was at first rigid, but afterwards, at the suggestion of Mr. Herring, it was held in place by a spring that allowed it to move slightly either upward or downward with reference to its normal position, thus modifying the action of the wind gusts upon it very much to its advantage. The guiding of the machine was effected by slight movements of the operator's body, as in the multiple-wing machines. Both these machines were much more manageable than the Lilienthal type, and their structural strength, notwithstanding their extreme lightness, was such that no fatalities, or even accidents, marked the glides made with them, although winds were successfully encountered much greater in violence than any which previous experimenters had dared to attempt.

Why I took up Flight.

My own active interest in aeronautical problems dates back to the death of Lilienthal in 1896. The brief notice of his death which appeared in the telegraphic news at that time aroused a passive interest which had existed from my childhood, and led me to take down from the shelves of our home library a book on "Animal

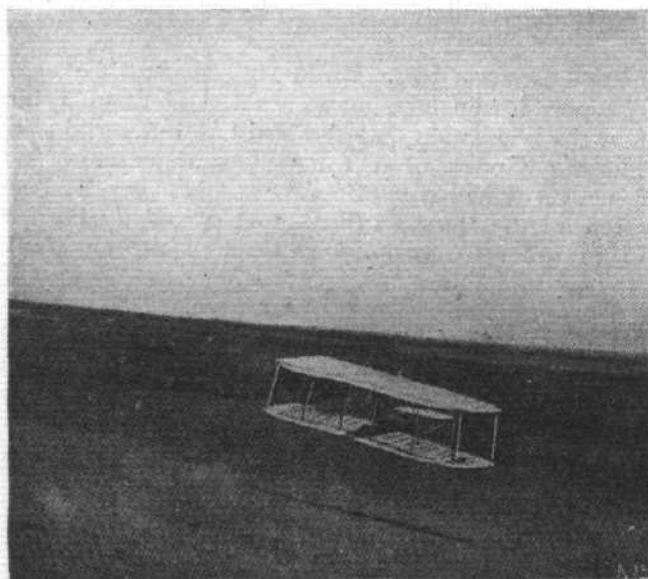
Mechanism," by Prof. Marey, which I had already read several times. From this I was led to read more modern works, and as my brother soon became equally interested with myself, we soon passed from the reading to the thinking, and finally to the working stage.

It seemed to us that the main reason why the problem had remained so long unsolved was that no one had been able to obtain any adequate practice. We figured that Lilienthal in five years of time had spent only about five hours in actual gliding through the air. The wonder was not that he had done so little, but that he had accomplished so much. It would not be considered at all safe for a bicycle rider to attempt to ride through a crowded city street after only five hours' practice, spread out in bits of ten seconds each over a period of five years; yet Lilienthal with this brief practice was remarkably successful in meeting the fluctuations and eddies of wind gusts.

The Glider Kite.

We thought that if some method could be found by which it would be possible to practise by the hour instead of by the second, there would be hope of advancing the solution of a very difficult problem. It seemed feasible to do this by building a machine which would be sustained at a speed of 18 m.p.h., and then finding a locality where winds of this velocity were common. With these conditions, a rope attached to the machine to keep it from floating backward would answer very nearly the same purpose as a propeller driven by a motor, and it would be possible to practice by the hour, and without any serious danger, as it would not be necessary to rise far from the ground, and the machine would not have any forward motion at all.

We found, according to the accepted tables of air pressures on curved surfaces, that a machine spreading 200 sq. ft. of wing surface would be sufficient for our purpose, and that places could easily be found along the Atlantic coast where winds of 16 to 25 miles were not at



A low glide on the 1901 model. Often the machine was only a few inches from the ground.

all uncommon. When the winds were low, it was our plan to glide from the tops of sandhills, and, when they were sufficiently strong, to use a rope for our motor and fly over one spot.

(To be continued.)

PARIS FLIGHT SHOW.

FIRST IMPRESSIONS OF AN ARTISTIC AND FASCINATING DISPLAY.

IF one wants seriously to study the current Aero Exhibition at the Grand Palais in Paris, the thing cannot be done in a matter of a day or two. In like fashion, so important a display cannot be dismissed in a single issue of *FLIGHT*, though every page in that issue were devoted to it. Therefore, the more convenient way to treat the matter will be to give a general impression of the Exhibition this week, and to proceed to a study of details in subsequent issues. Happily for those who were unaware last week of the really representative nature of the gathering together of all manner of things pertaining to aeronautics, the doors of the Grand Palais will remain open for a fortnight more, and throughout the Juvisy meeting, which commences in a couple of days.

The first thing that struck one on approaching the building at 10 o'clock on Saturday morning last, when President Armand Fallières was due to open it, was that, whereas it took about three-quarters of an hour to get to the turnstile where admission was free by ticket of invitation, you could walk in solitary splendour to the five franc entrance turnstile, and the men who took the money seemed absolutely amazed that anybody should be such a fool to pay when seemingly everybody in Paris had been invited to attend the show free of charge. One supposes the notion of the organisers in making quite sure that there should be a throng at the opening of this

exhibition was a laudable one. Certainly it achieved the object of enabling an announcement to be made that over 100,000 people had visited the Show by Monday last. But the interest the French public takes in aeronautics is sufficiently healthy and wide-spread to have justified greater pluck on the part of the promoters, who were seemingly scared by the ingenious and scarcely patriotic piece of enterprise of certain individuals who succeeded, quite unexpectedly, in bringing off the Aviation Meeting in Berlin, at least as far as securing the services of the leading flying men is concerned. Incidentally, while paper was flying about, it is somewhat amusing to notice that whereas the organising committee knew quite well to what papers and addresses to send out all their paragraphs for the favour of publication, somehow or other they forgot those names and addresses when Press tickets were being issued. Of course, one had many times, too, the amusing experience of going up and inquiring concerning some details of a given machine with a view to publishing some account of them, and being regarded as a lunatic, because in France they cannot imagine anybody publishing one line of an article about any product for the mere sake of the general interest that may repose in it, and without any payment. On the other hand, in about fifty per cent. of cases the amusing lunacy of the British Press was evidently beginning to be



PARIS FLIGHT SALON.—View looking down the Grand Palais. The machines seen prominently in the stands are—on the right a Chauviere (makers of the famous propellers), a Vinton helicoptère, and then two Bleriot; on the left side are a Duthell-Chalmers biplane, a "W.L.D." monoplane, the Henriot monoplane, and two Antoinettes. Hanging from the roof is the gas-bag of one of the Zodiac dirigibles, and in the far distance the great yellow spherical balloon of the Continental Co.

understood by these French flying machine and motor manufacturers, for as soon as they found they were being talked to on behalf of British publications they welcomed one with open arms, knowing full well that this country is the only one that possesses newspapers that will devote their columns to the ingenuities of a product for the mere sake of the interest it may be to the public.

There are many truly French touches about the Exhibition, most of them very attractive, a very few of a kind that are not creditable. Under the heading of the attractive and typical French touches may be mentioned the rationally cheap, exceedingly artistic and splendidly effective uniform scheme of stand decoration, though it appears to us to be considerably invidious that there should be four "Stands of Honour" deliberately so styled in the official plan of the Exhibition. Moreover, these four stands are occupied respectively by the Wright, Antoinette, Farman, and Esnault-Pelterie machines, so that we find that Voisin, whose biplanes must certainly rank as the parent practical ones in the history of French aeronautics, is not included among the honoured quartette. In the centre of an amply vast space there is fittingly shown the oil-stained Bleriot cross-Channel flyer. None will dispute its right to be there.

But anyone may wander about the Exhibition for a day, and from any part of the ground floor might view the display for all eternity, and yet would not be able to discover that in that building there is shown the first machine to achieve motor-propelled flight with a pilot on board and a voluntary conclusion. It is tucked away in the most perfectly complete manner conceivable, whereas surely such an aeroplane should have been put under the vast dome in the ample space beside the Bleriot monoplane, particularly as this first power-driven flyer of a practical sort is a biplane, the features of which differ radically from the modern single-surface machine. The pioneer flyer in question is the Wrights' biplane that flew as long ago as December 17th, 1903, and which is the identical biplane that was ahead of all competitors up to the last day of last year, when it made the memorable long-distance flight that won the Michelin Prize. There can be no manner of excuse for hiding such a historic production in a room at the top of the grand staircase, with a wall in front of the machine, so that you cannot see any part of it until you chance to go right into the room. For ourselves, we would suggest that the Exhibition would have been rendered twice as interesting if, in the vast space at disposal in the centre, the Bleriot cross-Channel monoplane had been placed facing the entrance, as at present, while on one side it should have been flanked by Ader's famous "Avion," that was the first power-driven machine to make a flight, albeit it had an involuntary conclusion, and on the other side by the Wright biplane that flew at Kittyhawk nearly six years ago, and which at least two kings have much enjoyed the privilege of studying in detail.

What the Frankfort Exhibition is to dirigible ballooning, the current display is in relation to aeroplaning. This Show in the Grand Palais will go down to history as the first display of nearly 30 full-scale modern aeroplanes. And it is certain that by next season some understanding will have to be arrived at whereby when balloons and dirigible balloons are being shown there shall be no aeroplanes, and the other way about, for there is only one very small dirigible, the Mallet-built "Zodiac" for Comte De La Vaulx, and there are only three modern spherical balloons, including the "Continental" and the

"Michelin," in the main hall, yet it is amply full. To attempt to house full-scale military dirigibles even in so vast a hall would be to create an atmosphere of depression by over-shadowing everything. At the rate at which the industry is growing, it is plain that by next year it will be necessary to limit the exhibits to one of each type of aeroplane. Also there is room for a certain amount of organisation so that in certain cases the arrangement of the exhibits shall not be quite so invidious.

The display divides itself into interests of two sorts. As soon as one is in the building, one takes it for granted that this is primarily an exhibition of aeroplanes and aerial motors, and is instinctively inclined very much to disregard the lighter-than-air machines, looking on them merely as features of the decoration, quite one of the most beautiful things being the very faithful reproduction in light brown and dark blue of the Montgolfier, familiar to all students of aeronautics. Now, either the slight modifications and changes in the well-known aeroplanes and aerial engines may first of all be chosen for study, or those of both sorts which are quite new may be sought out. The improvements of familiar types are, of course, not so obvious as are the entire novelties. For example, one may spend many hours looking over the Wright and Voisin biplanes and the Bleriot and Antoinette monoplanes without discovering a single change of detail, while even in the Pelterie monoplane, that is a conspicuous exhibit by reason of the red Continental fabric used, the changes are not numerous, albeit they chance to be of such a nature as to catch the eye, for there is now no horizontal rudder at the back, there being a feathering plane only, while in regard to rising or falling, the pilot now employs only the angle at which the main planes attack the wind, that angle being variable on the well-known Pelterie method. The steering-rudder is now above the feathering plane instead of below it, while the sustaining surface of the machine has been extended from 16 to 20 square metres, and the length from fore to aft is 9.60 metres, while the latest Esnault-Pelterie motors have two valves and are rated at 30-35-h.p.

Much more easy than the discovery of this class of novelty is that of the radically new machines, quite one of the most conspicuous being the 10-plane machine shown on the De Dion-Bouton stand. In profile it is very like a Wright biplane, but as soon as one glances at it from in front, one sees that the large arms extend at an acute angle from the centre of the machine, carrying each five centrally-pivoted and independent planes graded in size, the largest being at the top or outermost extremity, and the smallest at the bottom, the whole presenting somewhat the appearance of two opposed stairways. It is called a "dixplane," has a maximum spread of 39½ ft., and an over-all length of 29½ ft., while the surface of the ten weight-carrying planes is 54.2 square metres. There are three forward planes in the elevating plane position, only two of them being variable as to the angle at which they are presented to the wind. Four wooden propellers are furnished, being timed to turn at the same speed as the Wright ones. An 8-cylinder V-set 100-h.p. De Dion motor is used, in combination with chain-power transmission. One of the features of the ten sustaining planes is that they are each pivoted centrally to the struts, in such a fashion that they can be inclined symmetrically in relation to the vertical axis of the apparatus. The theory is that the movement of these planes enables lateral stability to be achieved by reason of the increase or decrease of the surface presented to the one side or

the other. The movement is also designed to allow a gradual descent in the event of the motor failing, when the planes are placed instantly in such a position that they form parachutes. It is interesting to learn that a biplane and a monoplane are also being built at the De Dion works.

The next most conspicuous novelty is the small Santos Dumont monoplane in which a very good flight was made recently, after which it was announced that M. Santos Dumont was going to give his plans to the public. It now appears, however, that he has come to an arrangement with the Clement-Bayard firm, of which MM. Adolf Clement and Charron are the chief partners, for manufacturing these machines at a retail price of £300 each, while a good deal of publicity is being secured for the three parties that are concerned by the mention that the type of Darracq engine which M. Dumont used on his famous flight will be made by the Clement-Bayard firm—an arrangement which, of course, gives the Darracq firm an admirable opportunity of saying, "Certainly not." The Santos Dumont aeroplane is a thing which, apart from the question of the engine and the propeller, costs next to nothing to make, nor should any lengthy wear be expected out of it. It does not strike one as being a high-class engineering proposition or a machine built to outlast more than one brief season; but as a *voiturette* of the air, which it is intended to be, or, to quote M. Dumont's own phrase, "*un aeroplan de vulgarisation*," it is bound to enjoy a widespread vogue. In view of the special interest attaching to this little flyer, we give elsewhere in this issue a description in detail, together with drawings to scale, so that any of our readers can avail themselves of the generous offer made by M. Dumont of throwing his patent rights open to the world without return of any sort.

There are quite a number of new single surface machines, including the Hanriot type that is introduced by the famous motor-car racing driver, and specimens of which are to be handled in competition shortly by himself, his old colleague Wagner, and Edmond. The machine is not notably original but combines many well-approved features. In the matter of landing and the system of supporting the main planes, it follows Antoinette practice as well as in regard to the tail planes and rudders; but at the back there is a skid as in the Santos Dumont style. The overall length is 20 ft., the maximum breadth being 29.9 ft., while the wing surface is 24 square metres, the total weight working out to 731 lbs., allowing for a motor of 209 lbs. which develops 55-h.p. The main plane of this machine, however, is not divided in two, and is absolutely straight from tip to tip.

The Avia monoplane is also a machine having a single tractor screw, the model shown being fitted with a 20-h.p. Dutheil-Chalmers engine, but subsequent machines

Rheims Aerodrome and School of Flight.

ONE of the developments of the Rheims meeting is that a scheme has been drawn up for the creation of a permanent aerodrome and the establishment of a school of flight on the plains of Betheny. It is proposed that the school should possess a machine of each successful type, so that the prospective flyer can be taught to manipulate any particular aeroplane to which his fancy inclines. The scheme has very influential backing, and provided it is carried out on the lines indicated by the promoters, its foundation should mark another of the most important stages in the recent remarkable development of aviation.

of the type will be fitted with a 50-h.p. motor of the same design.

The Koechlin monoplane suggests a combination of Antoinette and Bleriot practice, the wings having a span of 26 feet only, and the weight in flying order being 572 lbs.

The Gregoire-Gyp is another monoplane more or less of the Bleriot sort.

Of less conventional design is the Gangier machine, that has curved extension to the ribs that jut out in front of the main plane, the extremities of which are curved towards the back. The body is somewhat boat-shaped. The front of the chassis puts one in mind of Voisin and Bleriot practice, and two screws are used in connection with the chain drive.

Among startlingly unusual designs, one must not omit to mention the Autoplane, that is seemingly a series of curves, the foremost one being with the tip of the wings downward like an inverted U and the rear ones having the tips turned upwards but far less abruptly. The exhibit is by MM. E. Aime and E. Salmon.

A reminder of the letter U inverted is furnished also in the case of the very unusual "Raoul-Vendome No. III," which is a monoplane with hinged tips attached to the extremities of the wings, while the frame is more or less like a caricature of a skeleton, consisting of a sort of spine bent somewhat like a bow, and attached at the front end to the apex of the inverted U, at either extremity of which there is furnished a wheel. At the end of the spine there are two horizontal longitudinal panels, and below the spine the back one is hinged and serves as a rudder. Jutting from the top of the rear extremity there is a small plane having a pronounced curve, and serving as a stabiliser by reason of its being variable as to the angle of its attacking the wind.

The new biplanes are anything but numerous. There is the Fernandez, that puts one more in mind of Curtiss than any other practice, being equipped with three wheels and a single runner. The wings are relatively small, and have a pronounced curve. They cannot be warped, but they have rear extension flaps, the angle of incidence of which can be varied at the will of the pilot. There is only one forward elevating plane, but there is a companion one in the rear of the main planes. The Clement-Bayard biplane of the latest sort is very reminiscent of Farman and Voisin practice. Like both these machines, a central propeller is behind the main planes, the corners of which, however, are rounded off something in the Wright fashion. Caster type of wheels are used in front. A four-cylinder vertical Clement-Bayard engine and the propeller are behind the pilot. The Dutheil-Chalmers biplane is not wholly unfamiliar to the British public, the specimen shown being in many points like the Cody machine.

Ball Bearings for Flyers.

WE learn that the 60-h.p. engine which secured the world's record for speed for Mons. L. Bleriot's monoplane at Rheims on August 28th, when one lap (10 kiloms) was covered in 7 mins. 47 $\frac{1}{2}$ secs., was fitted on Hoffmann's ball bearings. In spite of the engine being burnt after the accident which occurred subsequently, the bearings were in perfect condition, and it was therefore possible to fit the engine on a new monoplane. Perfect accuracy in bearings, such as characterises the Hoffmann, should appeal especially to the aviator upon the life of whose engine, and its easy running, depends so much of his safety and his success.

BERLIN FLYING WEEK.

DESPITE the presence of several successful aviators, it appeared at first as though the Berlin Flying Week, which opened on Sunday last, would fall very flat, but on Monday public interest in the doings of the flyers was raised to the highest pitch by the splendid flight of Latham across country, from the Tempelhof field, where he had been practising, to the aerodrome at Johannisthal. Orville Wright decided to take no part in the competitions, but with Latham, Farman, Bleriot, Rougier, Leblanc, and several other Voisin and Farman pilots present there was always a good deal of excitement in the enclosures, although of course records were not broken so easily as at Rheims. On the opening day there was very little accomplished and the huge crowd which gathered had very little to reward its patience. De Caters made a few circuits round the $2\frac{1}{2}$ kilom. course and Bleriot did the same, but neither continued long enough to qualify for the speed prize. Leblanc started on the Bleriot, but he only got half-way round the course, while Farman, who brought out his machine, found the darkness fell rapidly and decided to postpone his attempt to the next day. Very little was done on Monday beyond Latham's cross-country trip, which by its daring at once made the intrepid Latham the favourite with the crowd. He covered the $6\frac{1}{2}$ miles in about 7 minutes. He first made two circuits of the Tempelhof field, and then went off in the direction of the Johannisthal. Then as soon as the telephonic message intimated that Latham was on his way, everyone strained their eyes to discover the speck in the sky. He made a wide sweep, and before coming to earth completed two circuits of the aerodrome, when he was given a great ovation. Tuesday found a good deal of activity going on, and several flyers made attempts for the prizes, but the best performance was on the part of Rougier, who flew 44.75 kiloms. in 52 mins. Latham and Farman both competed for the Speed Prize, the former taking

18 mins. $4\frac{3}{5}$ secs. for the 20 kiloms. and the latter 20 mins. $9\frac{2}{5}$ secs. Bleriot did not quite complete the 20 kiloms. Rougier made an attempt for the Height Prize, which has been presented by Count Zeppelin, during his long flight, but only got up to 100 metres.

Edwards, who was using a Voisin machine, had a nasty tumble after completing three circuits, but fortunately he escaped with nothing worse than a few slight cuts. De Caters, too, slightly damaged his biplane by a sudden landing.

Wednesday, too, was a busy day, and the incidents were not all in the air. Organisation, or want of it, was mainly to blame, and the climax was reached when the aerodrome company, under an order of a law officer, took possession of M. Bleriot's machine. It is understood that this was in consequence of M. Bleriot leaving for Cologne in spite of an agreement to stay and fly at Berlin on five days, for which he had been paid £1,000. As he refused either to stay at Berlin or return the money, an embargo was placed upon his flyer. In sympathy with his friend, M. Leblanc notified the company that he would not fly any more there.

Rougier was again the most successful of the aviators, and made thirty-one rounds of the course, his distance and time being officially returned at $77\frac{1}{2}$ kiloms. in 1 hr. 37 mins. Latham was not very far behind this, he having completed $67\frac{1}{2}$ kiloms. in 1 hr. 14 mins. Leblanc, Molon, and Sanchez Besa made several short flights during the day, and Farman had a try for the Speed Prize, but his time was not so good as on the previous day.

During the week previous to the opening of the flying week, Latham had been practising on the Tempelhof field, and his best flight was made on Thursday evening, when he kept aloft for 1h. 2m. 56s.

Herr Grade Has a Fall.

WHILE making an attempt to win the Lanz Prize of £2,000 at the Mars flying ground, near Berlin, Herr Grade had a nasty accident with his monoplane, but fortunately without injury to himself. The regulations stipulated that a flight of $2\frac{1}{2}$ kiloms. should be made in a

figure of eight. Herr Grade started off splendidly, but in the middle of the trip the propeller broke and the machine fell about 30 metres, but the force of the fall was broken by some low pine trees. The machine was badly damaged, but it was hoped that it would be repaired in a few days.



Herr Grade, the German aviator, who has been flying on his monoplane at the Mars Aerodrome, near Bork, for the Lanz prize.

FLYING AT SPA.

NOTHING very exciting transpired at Spa during last week and on Sunday. Delagrance had in five days remained in the air only a total of $32\frac{1}{2}$ mins., while Sommer, who was next, had only flown 25 mins. 45 secs. altogether. On Saturday and Sunday there was heavy rain and wind which spoilt all chances of flying, and both Sommer and Delagrance had their machines badly smashed on Sunday. The meeting opened on the 21st, when Sommer, Paulhan, Delagrance, and Le Blon arrived with their machines. The honour of being the first in the air fell to M. Delagrance, and on the 22nd he flew for 11 kiloms. at a height of 6 or 8 metres. Four flights were made the next day by Delagrance, the longest being three times round the ground in 5 mins. 4 secs. Paulhan succeeded in rising, but he landed suddenly, and Sommer flew outside the ground and landed about 3 kiloms. away from his shed. Three of the aviators flew on the 24th, Delagrance completed four circuits, and Sommer five, while Le Blon, who is being instructed by Delagrance, succeeded in going round the ground twice quite easily. Wind and rain made the conditions very uncomfortable on Saturday last,

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but in spite of that Sommer succeeded in keeping aloft for 16 mins. 27 secs., and Delagrance also made five rounds of the course in 10 mins. 38 secs. Sunday was very bad, and as we have said both Sommer and Delagrance smashed their machines. In the former's case it was due to some people getting in his way, causing him to come down suddenly; while in the case of Delagrance, he had flown four times round the ground, and came down all right, but when close to his shed the front wheels stuck in a ditch, and the machine tipped up, breaking both wings. It was then decided to postpone the meeting for a couple of days.

The flying was resumed on Tuesday, but the only man to do anything worth noting was Le Blon, who made a splendid flight of 23 kiloms., occupying about as many minutes. M. Paulhan announced that in consequence of the unsatisfactory state of the ground he had decided not to make any further attempts to fly at Spa. Wednesday produced a new world's record when Delagrance succeeded in rising clear from the ground in 49 metres, thus bettering the previous best of 60 metres made a few days ago by M. Santos Dumont.

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RHEIMS RECORDS AS OFFICIALLY RECORDED.

OFFICIAL recognition has just been accorded by the Commission Aerieenne Mixte to the following records made during the Rheims Meeting.

AEROPLANES.

Distance Records.

Paulhan, August 25th, 1909	...	134 kiloms. environ.
Latham, August 26th, 1909	...	154'620 kiloms.
Farman, August 27th, 1909	...	180 kiloms.

Duration Records.

Paulhan, August 25th, 1909	...	2h. 43m. 24 $\frac{3}{4}$ s.
Farman, August 27th, 1909	...	3h. 4m. 56 $\frac{3}{4}$ s.

Height Record.

Latham	155 metres
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WRIGHT BROTHERS

Flying Round the Statue of Liberty.

ONE of the first landmarks of America which meets the eye of the visitor from Europe who lands in New York is the gigantic statue of Liberty which stands at the entrance to the harbour, and on Wednesday last those who were returning from America on the "Lusitania" had an experience which will no doubt live for ever in their memory. As they were leaving the harbour Wilbur Wright rose in his aeroplane from Governor's Island, and, passing over the ship, made straight for the statue of Liberty, circling round it before flying back to his starting place a mile away. It was a sight to have lived for, and was wildly cheered by the immense crowds which lined the banks of the Hudson River and the passengers on the various liners. Curtiss had also intended to perform the same feat, but he contented himself with a circular flight over the island.

Wright Brothers and Others.

FROM New York it is reported that Wilbur Wright has announced that as he claims that the Farman and

Speed Records.

Kiloms.		h.	m.	s.	Kiloms.		h.	m.	s.
10	Bleriot ...	0	7	47 $\frac{1}{2}$	70	Latham ...	1	3	6
20	Curtiss ...	0	15	50 $\frac{1}{2}$	80	Latham ...	1	11	26 $\frac{1}{2}$
30	Curtiss ...	0	23	29 $\frac{1}{2}$	90	Latham ...	1	19	56 $\frac{1}{2}$
40	Latham ...	0	34	55	100	Latham ...	1	28	17
50	Latham ...	0	43	56	150	Latham ...	2	13	9 $\frac{1}{2}$
60	Latham ...	0	52	44 $\frac{1}{2}$					

Speed Record with One Passenger.

10 kiloms.	Farman	9m. 52 $\frac{1}{2}$ s.
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Speed Record with Two Passengers.

10 kiloms.	Farman	10m. 39s.
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DIRIGIBLES.—Speed Records (Colonel Renard).

Kiloms.	m.	s.	Kiloms.	h.	m.	s.	Kiloms.	h.	m.	s.
10 ...	16	31	30 ...	0	48	31 $\frac{2}{3}$	50 ...	1	19	49 $\frac{1}{2}$
20 ...	31	58 $\frac{2}{3}$	40 ...	1	3	28 $\frac{1}{3}$				

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AND THEIR FLYER.

Bleriot machines infringe the patents held by himself and his brother Orville, they will institute legal proceedings against all persons taking such machines into the United States. According to an interview with a Press representative, this threat is not looked upon very seriously by M. Bleriot, and his firm have no fear of any legal action.

Wright Brothers' Aerodrome.

It is reported from Springfield, Ohio, that the Wright Brothers have purchased about 700 acres of land at Tippecanoe, near Springfield, where they propose to erect an extensive factory for the manufacture of their flyers. The extensive ground will also be used for experimental purposes.

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Balloon Photography.

AMONG the exhibits at the annual exhibition of the Royal Photographic Society are some very interesting photographs taken from balloons.

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Herr Grade Has a Fall.

WHILE making an attempt to win the Lanz Prize of £2,000 at the Mars flying ground, near Berlin, Herr Grade had a nasty accident with his monoplane, but fortunately without injury to himself. The regulations stipulated that a flight of $2\frac{1}{2}$ kiloms. should be made in a

figure of eight. Herr Grade started off splendidly, but in the middle of the trip the propeller broke and the machine fell about 30 metres, but the force of the fall was broken by some low pine trees. The machine was badly damaged, but it was hoped that it would be repaired in a few days.



Herr Grade, the German aviator, who has been flying on his monoplane at the Mars Aerodrome, near Bork, for the Lanz prize.

FLYING AT SPA.

NOTHING very exciting transpired at Spa during last week and on Sunday. Delagrangé had in five days remained in the air only a total of $32\frac{1}{2}$ mins., while Sommer, who was next, had only flown 25 mins. 45 secs. altogether. On Saturday and Sunday there was heavy rain and wind which spoilt all chances of flying, and both Sommer and Delagrangé had their machines badly smashed on Sunday. The meeting opened on the 21st, when Sommer, Paulhan, Delagrangé, and Le Blon arrived with their machines. The honour of being the first in the air fell to M. Delagrangé, and on the 22nd he flew for 11 kiloms. at a height of 6 or 8 metres. Four flights were made the next day by Delagrangé, the longest being three times round the ground in 5 mins. 4 secs. Paulhan succeeded in rising, but he landed suddenly, and Sommer flew outside the ground and landed about 3 kiloms. away from his shed. Three of the aviators flew on the 24th, Delagrangé completed four circuits, and Sommer five, while Le Blon, who is being instructed by Delagrangé, succeeded in going round the ground twice quite easily. Wind and rain made the conditions very uncomfortable on Saturday last,

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but in spite of that Sommer succeeded in keeping aloft for 16 mins. 27 secs., and Delagrangé also made five rounds of the course in 10 mins. 38 secs. Sunday was very bad, and as we have said both Sommer and Delagrangé smashed their machines. In the former's case it was due to some people getting in his way, causing him to come down suddenly; while in the case of Delagrangé, he had flown four times round the ground, and came down all right, but when close to his shed the front wheels stuck in a ditch, and the machine tipped up, breaking both wings. It was then decided to postpone the meeting for a couple of days.

The flying was resumed on Tuesday, but the only man to do anything worth noting was Le Blon, who made a splendid flight of 23 kiloms., occupying about as many minutes. M. Paulhan announced that in consequence of the unsatisfactory state of the ground he had decided not to make any further attempts to fly at Spa. Wednesday produced a new world's record when Delagrangé succeeded in rising clear from the ground in 49 metres, thus bettering the previous best of 60 metres made a few days ago by M. Santos Dumont.

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RHEIMS RECORDS AS OFFICIALLY RECORDED.

OFFICIAL recognition has just been accorded by the Commission Aérienne Mixte to the following records made during the Rheims Meeting.

AEROPLANES.

Distance Records.

Paulhan, August 25th, 1909	...	134 kiloms. environ.
Latham, August 26th, 1909	...	154.620 kiloms.
Farman, August 27th, 1909	...	180 kiloms.

Duration Records.

Paulhan, August 25th, 1909	...	2h. 43m. 24 $\frac{1}{2}$ s.
Farman, August 27th, 1909	...	3h. 4m. 56 $\frac{1}{2}$ s.

Height Record.

Latham	155 metres
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WRIGHT BROTHERS

Flying Round the Statue of Liberty.

ONE of the first landmarks of America which meets the eye of the visitor from Europe who lands in New York is the gigantic statue of Liberty which stands at the entrance to the harbour, and on Wednesday last those who were returning from America on the "Lusitania" had an experience which will no doubt live for ever in their memory. As they were leaving the harbour Wilbur Wright rose in his aeroplane from Governor's Island, and, passing over the ship, made straight for the statue of Liberty, circling round it before flying back to his starting place a mile away. It was a sight to have lived for, and was wildly cheered by the immense crowds which lined the banks of the Hudson River and the passengers on the various liners. Curtiss had also intended to perform the same feat, but he contented himself with a circular flight over the island.

Wright Brothers and Others.

FROM New York it is reported that Wilbur Wright has announced that as he claims that the Farman and

Speed Records.

Kiloms.		h.	m.	s.	Kiloms.		h.	m.	s.
10	Bleriot ...	0	7	47 $\frac{1}{2}$	70	Latham ...	1	3	6
20	Curtiss ...	0	15	50 $\frac{1}{2}$	80	Latham ...	1	11	26 $\frac{1}{2}$
30	Curtiss ...	0	23	29 $\frac{1}{2}$	90	Latham ...	1	19	56 $\frac{1}{2}$
40	Latham ...	0	34	55	100	Latham ...	1	28	17
50	Latham ...	0	43	56	150	Latham ...	2	13	9 $\frac{1}{2}$
60	Latham ...	0	52	44 $\frac{1}{2}$					

Speed Record with One Passenger.

10 kiloms.	Farman	9m. 52 $\frac{1}{2}$ s.
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Speed Record with Two Passengers.

10 kiloms.	Farman	10m. 39s.
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DIRIGIBLES.—Speed Records (Colonel Renard).

Kiloms.	m.	s.	Kiloms.	h.	m.	s.	Kiloms.	h.	m.	s.
10 ...	16	31	30 ...	0	48	31 $\frac{1}{2}$	50 ...	1	19	49 $\frac{1}{2}$
20 ...	31	58 $\frac{1}{2}$	40 ...	1	3	28 $\frac{1}{2}$				

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AND THEIR FLYER.

Bleriot machines infringe the patents held by himself and his brother Orville, they will institute legal proceedings against all persons taking such machines into the United States. According to an interview with a Press representative, this threat is not looked upon very seriously by M. Bleriot, and his firm have no fear of any legal action.

Wright Brothers' Aerodrome.

It is reported from Springfield, Ohio, that the Wright Brothers have purchased about 700 acres of land at Tippecanoe, near Springfield, where they propose to erect an extensive factory for the manufacture of their flyers. The extensive ground will also be used for experimental purposes.

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Balloon Photography.

AMONG the exhibits at the annual exhibition of the Royal Photographic Society are some very interesting photographs taken from balloons.

AERO CLUB OF THE UNITED KINGDOM.

OFFICIAL NOTICES TO MEMBERS.

Fixtures for 1909.

September 25–October 17 International Aeronautical Exhibition, Paris.
October 3 ... Gordon-Bennett Balloon Race, Zurich.

Committee Meeting.

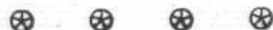
A meeting of the Committee was held on Tuesday, September 28th, 1909, when there were present: Mr. Roger W. Wallace, K.C., in the chair, Mr. Ernest C. Bucknall, Vice-Admiral Sir Charles Campbell, K.C.M.G., Col. J. E. Capper, C.B., R.E., Mr. Martin Dale, Prof. A. K. Huntington, Mr. V. Ker-Seymer, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. C. F. Pollock, Hon. C. S. Rolls, Mr. J. Lyons Sampson, Mr. Stanley Spooner, H. E. Perrin, Secretary.

New Members.—The following new Members were elected:—

Mrs. Isolda Gordon Arthur.	J. C. Mount.
Alan H. Burgoyne.	Llewellyn Preece.
Stanley Cooper.	Paris Singer.
Percy John Hays.	Frank Souter.
E. Austin Hurson.	Comtesse von Resetas.
Stephen A. Marples.	Noel Webster.
Capt. V. E. Montes.	Joseph Wilkinson.

Provincial Aero Clubs.

The Committee of the Aero Club of the United Kingdom have invited the representatives of various aero clubs in the provinces to a conference to be held at the offices of the Aero Club, 166, Piccadilly, W., on Friday, October 8th, 1909, at 3 p.m., to discuss the whole question of unity of action and purpose between the Aero Clubs in the provinces and the Aero Club of the United Kingdom.



PROGRESS OF FLIGHT ABOUT THE COUNTRY.

(NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary.)

Lancashire Aero Club.

At the last Committee meeting over 200 members were elected, including the Duke of Sutherland, the Earl of Derby, the Earl of Lathom, and the Marquis of Stafford, and many leaders in the motoring world. The Marquis of Waterford has consented to be one of the Vice-Presidents, and the residential club house will be opened in a few days.

Manchester Aero Club 9, ALBERT SQUARE).

At the meeting held at the Midland Hotel, Manchester, on Tuesday last, it was announced that the membership was now 275, and in view of that an entrance fee of one guinea will be charged upon future members.

Morecambe Aero Club (QUEEN'S SQUARE, MORECAMBE).

THE Secretary of this Club has sent us particulars of Morecambe Bay, from which we have prepared the accompanying sketch. It is suggested that the sands would make an ideal flying ground, and it will be seen that it would be possible to get a straightaway flight of over 10 miles at low water.

Northumberland Aero Club (4, ROSEBERY CRESCENT, JESMOND).

At the meeting held on the 27th ult., the formation of the Northumberland Aero Club, with headquarters at Newcastle, was decided upon, and arrangements are now being made with regard to the inauguration meeting. This will be held in a few days, and it is confidently expected that a gentleman of world-wide renown in engineering circles will take the chair. The subscription has been fixed at 10s. 6d. per annum, and for all who join before the 1st prox. no entrance fee will be charged.

Council.

Prince Roland Bonaparte has been unanimously elected to the Council of the Aero Club.

Blackpool Aviation Week.

The arrangements for the Members of the Aero Club in connection with the Blackpool Aviation Week, will be announced in next week's notices.

Monthly Dinner.

The monthly dinner will take place on Tuesday next, October 5th, at the Hotel Chatham, Regent Street, S.W., at 8 p.m. (5s. 6d. each). Members wishing to be present are requested to notify the Secretary not later than Monday, October 4th, 1909. Evening dress optional.

Gordon-Bennett Balloon Race.

The Gordon-Bennett Balloon Race will take place at Zurich to-morrow (Sunday). The Aero Club will be represented by Mr. F. K. McClean, who will have as aid Mr. A. Mortimer Singer. The new balloon, the "Planet," of 80,000 cub. ft. capacity, belonging to Mr. Singer, will be used in the race.

Juvisy Aviation Week.

Railway Arrangements.—The South-Eastern and Chatham Railway are issuing excursion tickets from London to Paris, available for fourteen days, on the following dates:—October 1st, 2nd, 8th and 9th. The trains leave Charing Cross at 10 a.m. and 2.30 p.m. (Paris arrive 11.26 p.m.) *via* Boulogne: or by the 9 p.m. service *via* Calais. The fares are as under:—

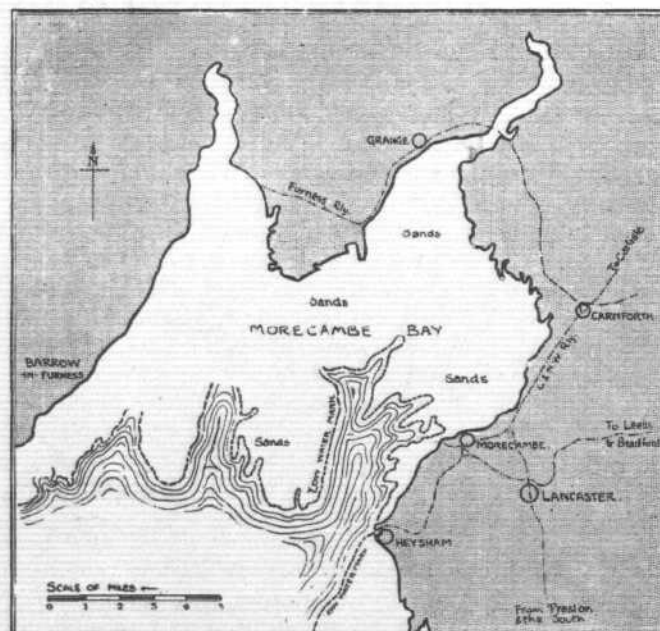
First class, £2 18s. 4d.; Second class, £1 17s. 6d.; Third class, £1 10s.

HAROLD E. PERRIN, Secretary.

166, Piccadilly, W.

Yorkshire Aero Club (59, WADE LANE, LEEDS).

At a meeting held on Tuesday night, Mr. Herbert Dunn, C.E., was elected chairman, Mr. Herbert A. Jones vice-chairman, Mr. N. de Lacy Evans treasurer, and Mr. A. E. Watson secretary.



AVIATION NOTES OF THE WEEK.

Aero Club of the U.K.—Subscription to be Increased.

IN view of the way in which the membership of the Aero Club is rapidly increasing it has been decided, as will have been seen from the official notices of last week, to raise the subscription and to charge an entrance fee after the membership has reached one thousand. These first thousand members will be designated "Founder Members." Those who contemplate joining should not therefore delay only to find themselves amongst those who will be called upon for the increased payment.

Aerial League President.

ON Thursday last, a general meeting of the Aerial League was held at the Carlton Hotel, at which Lord Esher was elected President of the League and the formation of an Advisory Council was decided upon.

£1,000 for a British Aero Motor.

HOLDING the belief that the solution of the aerial problem is being retarded by the want of a reliable motor suitable for aeroplane work, Mr. Patrick Y. Alexander has offered a prize of £1,000 for the first British aero motor of 20-h.p. which, under certain conditions, shall run continuously for twenty-four hours. The competition is to be held under the joint auspices of the Royal Automobile Club, the Aeronautical Society, the Aero Club of the U.K., and the Aerial League.

Mr. Cody's Progress.

As a result of his motor trip from London to Manchester, Mr. Cody has been able to lay his plans for his intended flight for the *Daily Mail* £10,000 prize. He was back at Aldershot on Saturday and twice flew round the plain, on one occasion with a passenger. Monday saw Mr. Cody actively at work on his aeroplane, and during the early morning Mrs. Capper, wife of Colonel Capper, was taken for a flight lasting about 4 mins. The fitting of a large lubricating tank occupied a good deal of time in the afternoon, but Mr. Cody made three more flights before night fell. In one he carried Commander Osborne, R.N., and then Mr. Rogers, the Secretary of the Midland Aero Club, had a trip of four minutes, after which Mr. Cody went up alone, and kept going for about eight minutes. He had previously paced out a distance of half a mile, and marked this by flags, and in the course of his flight he reckoned that he covered that distance in 35 secs. Large crowds of spectators are being attracted to Laffan's Plain, and Mr. Cody is often in jeopardy from the careless way in which some of these people place themselves in dangerous positions. If this continues no doubt some steps will shortly have to be taken for policing the plain, in the same way that the military do at Issy and Chalons.

Mr. Moore-Brabazon's Success.

ALL interested in the cause of aviation in Great Britain will join in congratulating Mr. J. T. C. Moore-Brabazon on the success he is meeting with in his experiments with his new British-designed-and-built biplane. It has been built by Messrs. Short Brothers, and is similar to the machine which was exhibited by them in skeleton form at the Olympia Show, the designer being Mr. Horace Short. In spite of the fact that he was handicapped by using a heavy motor car engine, Mr. Moore-Brabazon easily flew a mile in a semi-circular direction on Monday last, and he intended to compete for the 250 yards, the half mile, and

mile prizes offered by the Aero Club on Thursday of this week. When Mr. Brabazon has his new "Green" engine, which weighs about 200 lbs. less than the present motor, he is confident that he will make up all time lost in waiting for his present machine.

Success of Mr. Maurice Farman.

AT last Mr. Maurice Farman, brother to Mr. Henry Farman, has met with success with the biplane with which he has been experimenting at Buc since the beginning of the year. On Friday of last week he succeeded in flying for a quarter of an hour, during which he made a wide circuit over the surrounding country. Starting from the Plateau of Chateau-fort at Buc, he flew over the farm at Tousons and then along by the aqueduct for some distance. Guyancourt was then made for, and a wide sweep brought the aviator to Voisins, where a sharp turn was made, and he flew back to his shed. The trip was carried out without the slightest hitch, and on the way farmhouses, trees, &c., were passed over without difficulty. The machine, which follows the general lines of Mr. Henry Farman's flyers, but is much smaller, was fitted with an 8-cyl. Renault motor. It was illustrated on page 161 in our issue of February 6th.

Clement to Build "Demoiselles."

AT the opening of the Paris Salon it was announced that arrangements had been made by the Clement-Bayard firm to build 200 monoplanes to the same design as Santos Dumont's "Demoiselle," and the machine is exhibited at the Paris Show under the *aegis* of this firm, who are selling the machine complete at 7,400 frs. (£300). These machines will be fitted with a special engine built by the Clement firm, while the manufacture of the flyers is to be supervised by M. Santos Dumont.



DISASTER TO THE "REPUBLIQUE."

As a matter of history it is our painful duty to record the disaster which overtook the French military dirigible, "Republique," on Saturday last. After the successful completion of its work in connection with the army manoeuvres at La Palisse, the airship started on her 200 mile journey to her headquarters at Chalais Meudon. Her crew comprised Capt. Marchal, in command, Lieut. Chauré, and two mechanics. The vessel sailed safely over Varennes and Moulins, but soon after, when passing Avrilly, those who were following the dirigible in motor cars saw something flash in the sun and tear its way through the envelope. It was one of the propeller blades which had broken off. The gas escaped from the envelope with startling rapidity, and the disabled vessel fell like an arrow to earth. All the members of the crew were instantly killed by the tremendous shock. As to what caused the propeller blade to break is not clear, but it was apparently due to hasty repairs and the paramount duty of those in charge to obey military orders, however much their own doubts may question the wisdom or safety of those orders. We refer further to this matter in our leader on p. 602. Immediately after the disaster a fund was opened to replace the damaged airship, and not only so, but Messrs. Lebaudy Frères came forward in a public spirited manner and offered to present another one to the Government.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

MOTORS FOR FLYERS.

To the Editor of FLIGHT.

SIR,—I should be glad if you would kindly draw attention to the apparent laxity which is being shown by British manufacturers in supplying the enormous demand which there is at the present time for light aeroplane engines.

When the Prince of Wales gave us his stirring message, "Wake up, England, wake up," one would have thought that we should not again have been caught napping in any new industry which might spring up, but in the aeroplane business we are already two or three years behind the times.

I have ascertained that orders for aeroplanes amounting to nearly £100,000 have already been sent abroad, and we, ourselves, have been inundated with applications for foreign-built machines, owing to the fact that there is no British-built aeroplane yet on the market that has achieved any success.

Hundreds of orders are waiting for any firm who can produce a British-built machine, but the great obstacle in the way is that we have not yet produced a satisfactory engine for aeroplane work.

One would have thought that the British nation, which comprises some of the greatest engineers in the world, would, ere this, have produced a motor which would have been satisfactory in every respect.

Only during the past week we have, ourselves, had to refuse orders for at least a dozen machines because we cannot obtain delivery of a suitable British engine.

Perhaps if you would be kind enough to make these facts public it would stimulate British manufacturers to act at once so that they will not be entirely left behind in what will, I think, prove to be an industry equal to, if not greater than, the motor industry.

Yours faithfully,

JNO. W. BROWN,
Managing Director, Motor Supply Co., Ltd.

A PLEA FOR OUR ENGLISHMEN.

To the Editor of FLIGHT.

SIR,—I would like to say how perfectly I agree with all that "Homoc" writes. Surely England is forgetting her loyalty to her people, when she holds forth such attractions as Blackpool is doing now to those who do not belong to us, and give away what should be our delight and pleasure to crown our own countrymen with, not only honour and glory, but the needful thousands, which surely ought to be left in the British Isles for the good and improvement of the various classes.

Will not Blackpool consider a little beyond the temporary benefit this proposed aviation week will bring to her inhabitants, and wait awhile and give the Englishman a chance to compete with the foreigner, now that he is waking up and realising that he is not the first on the list, but give him time and an opportunity to show the world that he possesses even in a greater measure the determination and strength of will and character which his brothers across the water have so bravely displayed and for which we have due admiration. But let us be loyal to our own countrymen and "possess our souls in patience" just a little longer, until we proudly gaze upwards at our own people ascending in a glorious and triumphant flight.

P. A. H.

HELP FOR COVENTRY FLYERS.

To the Editor of FLIGHT.

SIR,—As a further incentive to prospective Coventry aviators, and having formerly been a resident of the interesting old City of the Three Spires, I shall have pleasure in presenting to the first local builder of a practicable aeroplane a 6 ft. "Hollands" propeller, of guaranteed highest efficiency, 10½ lbs. weight (with adequate strength), and of exceptionally good workmanship.

Yours faithfully,

London and York.

SIDNEY H. HOLLANDS.

TERMS IN FLIGHT.

To the Editor of FLIGHT.

SIR,—*Apologies* of aerological terms, how about the word "spine" for fore-and-aft length?

Yours faithfully,

Woldingham.

W. A. BARR.

[Other Correspondence has again to be held over.—ED.]

Juvisy Meeting and Paris Salon.

IN connection with the Aviation Week at Juvisy (near Paris), from October 3rd to 17th, the South-Eastern and Chatham Railway will issue cheap return tickets from Charing Cross to Paris, available 14 days, on October 1st, 2nd, 8th and 9th *via* Dover and Calais and *via* Folkestone and Boulogne. Those taking advantage of these facilities will also have the opportunity of visiting the great Paris Aviation Salon, which is now in full swing at the Grand Palais, remaining open until October 17th.



NEW COMPANIES REGISTERED.

Aerial Association, Ltd., 18, Fleet Street, E.C.—Capital £10, in £1 shares.

Carey and Co., Ltd., 40, New Kent Road, S.E.—Capital £2,000, in £1 shares (100 preference). Manufacturers of and dealers in balloons, aeroplanes, motors, &c. First directors, W. E. Pountney and L. Garraway.

Favata Aeroplane and Motor Syndicate, Ltd., 15 and 16, Cockspur Street, S.W.—Capital £6,000, in £1 shares. First directors, D. R. de Simone, M. G. de Simone, and G. F. Underwood.



Aeronautical Patents Published.

Applied for in 1908.

Published September 23rd, 1909.

23,129. W. HAMMANT. Aerial machines.
23,316. J. L. GARSED. Aerial machines.

Applied for in 1909.

Published September 23rd, 1909.

9,295. T. ELLIOTT. Blades of aerial propellers.

BACK NUMBERS OF "FLIGHT."

SEVERAL back numbers are now becoming **very scarce**, and when exhausted no more complete sets will be procurable.

The publishers have pleasure in announcing that they have secured a few of these back issues of FLIGHT, and any of our new readers who may wish for complete sets, No. 1 (January 2nd, 1909), to last week, including all the very scarce numbers, also No. 31, with Bleriot machine drawings to scale, and Curtiss biplane Number (No. 27), can obtain same post free for 15s. 5d. (abroad 17s. 2d.) from the Publishers, 44, St. Martin's Lane, W.C.

The publishers have only a limited reserve stock for bound volumes at end of year. Those wishing, therefore, to ensure obtaining Volume I complete, with Index and Title Page, can book same now at the price of One Guinea, bound in cloth. Orders will be booked for these in rotation as received. *As various numbers become scarce* the price will be raised accordingly.

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